REMARKS

This Amendment is in response to the Office Action mailed October 30, 2001. In the Office Action, the Examiner rejected claims 13 and 16 under 35 U.S.C. § 102 and claims 14, 15, and 17-34 under 35 U.S.C. § 103. Claims 13, 14, 17, 18, 21, 22, 27, 30, and 32 have been amended. Claims 13-34 remain pending in the application. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Drawings

1. The Examiner objects to the drawings under 37 CFR 1.83(a). The Examiner requests that plating gold on the copper (claim 19, line 5) and steps shown in claim 30 must be shown or the features canceled from the claim(s).

Applicants have tried to contact the Examiner to clarify the reason for this rejection. Since Examiner was unavailable at the time, Applicants invite the Examiner contact the Applicants' attorney to discuss the grounds for this rejection.

Applicants submit that Figures 5, 6, and 7 show the limitations of claim 19, line 5, recited above.

Figure 5 shows the "masking of all surfaces except for the edge of the bond shelf" (see also supporting description in page 8, line 24-27). Figures 6 and 7 illustrates "plating gold onto copper" by dipping the masked housing 11 into a plating bath 52 (Figure 7 shows the plated conductive strips 44 and 46

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formed by this process). This process is further described in the description of the invention page 8, lines 24, to page 9, line 8.

2. The Examiner rejected the proposed drawing corrections filed on January 3, 2002 because "[t]he original disclosure does not support the showing of the different layers of bonding pads from the conductive strips 44 and 46."

While Applicants disagree with the Examiner's rejection and submit that no new matter is added by the drawing corrections proposed in the substitute sheets of drawings dated January 3, 2002, Applicants herein withdraw the proposed changes with the intend of advancing the allowability of the present application.

3. The Examiner rejected the proposed drawing corrections filed on May 23, 2002 because "it is not in the form of a per-and-ink sketch showing changes in red ink or with the changes otherwise highlighted.

While Applicants' records indicated that the proposed drawing corrections filed May 23, 2002 were properly marked-up in red ink in accordance with MPEP § 608.02(v), Applicants herein resubmit the proposed drawing corrections. No new matter has been added.

Specification

4. The Examiner also objected to some of the amendments filed on January 3, 2002, to pages 7-9 of the specification under 35 U.S.C. 132 because the amendments allegedly introduce new matter into the disclosure. In particular the Examiner points to following: "different lawyer of", "As shown in Figure 1 ...

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bond shelf 18", and "to connect to a bonding pad 16." Further, Fig. 4 shows 44 and 46 are on different sides, not on top of one another.

While Applicants disagree that the particular amendments noted above constitute new matter as alleged, Applicants herein submit a new amendment to the same paragraphs of the specification. The matter previously objected to by the Examiner has been removed. Applicants submit that no new matter is being added by these amendments.

Rejection Under 35 U.S.C. § 112

6. The Examiner rejected claim 18 under 35 U.S.C. § 112, second paragraph, as containing subject matter which was not described in the specification. In particular, the Examiner states that the original specification fails to provide support for the language "masking all surfaces except for the edge of the bond shelf." The Examiner adds, "Figs. do not show masking IC, PCB, bond wires, etc."

Applicants respectfully traverse.

Applicants have tried to contact the Examiner to clarify the reason for this rejection. Since Examiner was unavailable at the time, Applicants invite the Examiner contact the Applicants' attorney to discuss the grounds for this rejection.

Applicants have amended the paragraph starting on page 8, line 24, correct a labeling error and more clearly describe that which is shown in the figures. No new matter has been added.

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To more clearly claim the invention, Applicants have amended the relevant language of claim 18 to "masking all surfaces of the bond shelf except for the second surface [along the thickness] of the bond shelf, and plating a conductive material onto the second surface of the bond shelf."

The objective standard for compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). The subject matter of the claim need not be described literally (i.e., using the same terms or in *haec verba*) in order for the disclosure to satisfy the written description requirement. (See MPEP 2163.02).

The Examiner has the burden of 1) identifying the claim limitation not described, and 2) providing reasons why a person of ordinary skill in the art would not have recognized the description of this limitation in the disclosure of the application as filed. (See MPEP 2163.04)

Applicants submit that a person of ordinary skill in the art would clearly understand "masking all surfaces of the bond shelf except for the second surface [along the thickness] of the bond shelf." as being supported by the specification. (See amended page 8, lines 24-27 - "The conductive strips 44 and 46 can be formed by initially masking off all surfaces of the package housing, except the edge 43 of the first bond shelf 18 with a plating resist maskant 50, as shown in Figure 5.").

Moreover, the Examiner has not provided reasons why a person of ordinary skill in the art, in view of page 8, lines 24-27, and Figs 4 & 5, would

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not have recognized the description of this limitation in the disclosure of the application as filed. (See MPEP 2163.04)

Additionally, in response to the Examiner's inquiry, it is well known in the art that circuit boards are masked and etched/plated prior to components being mounted (e.g., prior to ICs, bond wires, etc., being mounted). Note that the claim language as amended more clearly defines the location of the surface on which the conductive strip is plated.

Applicants resubmit that the original specification adequately describes the invention as claimed in Claim 18.

On page 8, lines 24-27, the specification states The conductive strips 44 and 46 can be formed by initially masking off all surfaces of the package housing, except the edge 43 of the first bond shelf 18 with a plating resist maskant 50, as shown in Figure 5." Figure 5 clearly shows that all surfaces of the package housing except the vertical surface (thickness) of the bond shelf are masked. Amended Figure 4, clearly shows that the first bonding shelf 18 has a conductive edge 44 and 46 along its thickness or vertical surface.

Applicant respectfully requests that the Examiner withdraw the objection made to claim 18 under 35 U.S.C. § 112, second paragraph.

8. The Examiner rejected claim 18 under 35 U.S.C. § 112, second paragraph, as being indefinite. In particular, the Examiner states that the language "masking all surfaces except for the edge of the bond shelf" renders the claim vague and indefinite. Applicants respectfully traverse.

The Examiner states "it is unclear which one of the shelf has this feature." (Office Action, page 4)

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To more clearly claim the invention, Applicants have amended the relevant language of claim 18 to "masking all surfaces of the bond shelf except for the second surface [along the thickness] of the bond shelf, and plating a conductive material onto the second surface of the bond shelf." In short, Applicants have more explicitly defined the surfaces being claimed (e.g., first surface, second surface, etc.).

Applicants assert that as amended a second surface is clearly defined. (See claim 13 - "forming a housing which has a bond pad located on a first surface of a bond shelf, the bond shelf having a second surface along the thickness of the bond shelf"). Therefore, it is clear that the second surface of the bond shelf claimed in claim 13 is the same second surface of the bond shelf being referenced in claim 18 ("masking all surfaces of the bond shelf except for the second surface of the bond shelf"). No other instance of a second surface of the bond shelf is directly or indirectly set out in the claims.

Applicants respectfully request that the Examiner withdraw the rejection of claims 18-21 under 35 U.S.C. § 112, second paragraph, as being vague and/or indefinite.

Rejection Under 35 U.S.C. § 102

10. The Examiner rejected claims 13 and 16 under 35 U.S.C. 102(b) as being anticipated by Arai et al. (U.S. Pat. No. 5,206,986).

To more clearly claim that with Applicants consider the invention, independent claim 13 has been amended to include the limitation - forming a conductive strip along the thickness (second surface) of the bond shelf.

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Applicants submit that Arai et al. does not teach forming a conductive strip along the thickness (vertical wall) of the bond shelf 50 (Figure 18). Conductive strip 58 in Arai et al. is not formed along the thickness (i.e., vertical wall) of the bond shelf 50 as claimed. Conductive strip 44, in Figure 4 of the present application, illustrates an example of a conductive strip 44 (as claimed) along the thickness (i.e., vertical wall) of the bond shelf 18.

Because Arai et al. fails to teach a conductive strip along the thickness of the bond shelf as claimed, Applicants respectfully requests that the Examiner withdraw the rejection of claims 13 and 16 under 35 U.S.C. § 102(b) as being anticipated by Arai et al. (5,206,986).

Rejection Under 35 U.S.C. § 103

12. The Examiner rejected claims 14–15, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (U.S. Pat. No. 5,206,986) in view of Sebesta (U.S. Pat. No. 6,014,809).

While Applicants disagree with the Examiner's assertion that Aria et al. in view of Sebesta teach or suggest the claimed invention, it is unnecessary to reach this argument since dependent claims 14, 15, and 17 are in condition of allowance as a result of their dependence on independent claim 13 (see arguments above). Neither Arai et al. nor Sebasta teach or suggest – forming a conductive strip along the thickness of the bond shelf – as claimed. Note that Sebasta, in Figs. 3, 4, 5, and 6 does not teach or suggest the claimed element since it merely teaches wrapping a conductor from the top surface of a board around an edge not forming a conductive strip along the thickness of the board as claimed.

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Applicants respectfully request that the Examiner withdraw the rejection of claims 14, 15, and 17 under 35 U.S.C. § 103(a) as being unpatentable over Arai et al. (5,206,986) in view of Sebesta (6,014,809).

13. The Examiner rejected claims 21-24 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (U.S. Pat. No. 5,877,553) in view of Sebesta (U.S. Pat. No. 6,014,809).

To more clearly claim that with Applicants consider the invention, independent claim 21 has been amended to include the limitation - forming a conductive strip along the thickness (second surface) of the bond shelf.

Applicants submit that Arai et al. does not teach forming a conductive strip along the thickness (vertical wall) of the bond shelf 50 (Figure 18). Conductive strip 58 in Arai et al. is not formed along the thickness (i.e., vertical wall) of the bond shelf 50 as claimed. Conductive strip 44, in Figure 4 of the present application, illustrates an example of a conductive strip 44 (as claimed) along the thickness (i.e., vertical wall) of the bond shelf 18.

Applicants respectfully requests that the Examiner withdraw the rejection of claims 21-24 and 27 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (5,877,553) in view of Sebesta (6,014,809).

14. The Examiner rejected claims 25-26 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (U.S. Pat. No. 5,877,553) in view of Sebesta (U.S. Pat. No. 6,014,809) and further in view of the official notice taken by the Examiner.

While Applicants disagree with the Examiner's assertion that Nakayama et al. in view of Sebesta and further in view of the Examiner's official notice

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teach or suggest the claimed invention, it is unnecessary to reach this argument since dependent claims 25-26 are in condition of allowance as a result of their dependence on independent claim 21 (see arguments above).

Applicants respectfully requests that the Examiner withdraw the rejection of claims 25-26 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (5,877,553) in view of Sebesta (6,014,809) and further in view of the official notice taken by the Examiner.

15. The Examiner rejected claims 28-29 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (U.S. Pat. No. 5,877,553) in view of Sebesta (U.S. Pat. No. 6,014,809) and further in view of Lee (U.S. Pat. No. 5,089,878).

While Applicants disagree with the Examiner's assertion that Nakayama et al. in view of Sebesta and further in view of Lee teach or suggest the claimed invention, it is unnecessary to reach this argument since dependent claims 28-29 are in condition of allowance as a result of their dependence on independent claim 21 (see arguments above).

Applicants respectfully requests that the Examiner withdraw the rejection of claims 28-29 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (5,877,553) in view of Sebesta (6,014,809) and further in view of Lee (5,089,878).

16. The Examiner rejected claims 30-34 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (U.S. Pat. No. 5,877,553) in view of Sebesta (U.S. Pat. No. 6,014,809) in view of Lee (U.S. Pat. No. 5,089,878) and further in view of Hamzehdoost et al. (U.S. Pat. No. 5,491,362).

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While Applicants disagree with the Examiner's assertion that Nakayama et al. in view of Sebesta in view of Lee and further in view of Hamzehdoost et al. teach or suggest the claimed invention, it is unnecessary to reach this argument since dependent claims 30-34 are in condition of allowance as a result of their dependence on independent claim 21 (see arguments above).

Applicants respectfully requests that the Examiner withdraw the rejection of claims 30-34 under 35 U.S.C. § 103(a) as being unpatentable over Nakayama et al. (5,877,553) in view of Sebesta (6,014,809) in view of Lee (5,089,878) and further in view of Hamzehdoost et al. (5,491,362).

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Marked-up Version of the Specification As Amended

Please enter the following amendments:

Page 7, line 23, the paragraph beginning there at was amended as follows:

"The bond pads 16, contacts 32 and busses [layers] 24 [,] and 26, routing traces 28, and bus 30 [and 32] may all be interconnected by vias 38. The busses 24 and 26 may include clearance spaces 42 that electrically isolate the busses 24 and 26 from the vias 38. Additionally, the busses 24 and 26 are also separated by spaces 43."

Page 8, line 1, the paragraph beginning there at was amended as follows:

"Figure 4 shows a first conductive strip 44 and a second conductive strip 46 that wrap around an edge of the first bond shelf 18 [20] to connect the bond pads 16 to the power busses 24 and 26. The conductive strips 44 and 46 can be separated by a pair of notches 48 formed in the first bond shelf 18 [20]. Some of the bond pads 16 are connected [by strip 44] to bus 24 by conductive strip 44 while other bond pads 16 are connected to bus 26 by strip 46. The separate strips allow the bond pads 16 on the first shelf 18 to be connected to two different voltage levels. The other bond pads 16 on the first

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bond shelf 18 may be [20 are] interconnected to other layers and/or contacts 34 by vias 38."

Page 8, line 24, the paragraph beginning there at and continuing onto page 9 was amended as follows:

"The conductive strips 44 and 46 can be formed by initially masking off all surfaces of the package housing, except the edge 43 of the [third shelf 22] first bond shelf 18 with a plating resist maskant 50, as shown in Figure 5. The masked housing can then be dipped into a plating bath 52 as shown in Figure 5. The plating bath 52 plates a conductive material such as copper onto the edge 43 of the first bond shelf 18. The maskant 50 is then removed and the notches 48 can be drilled into the edges of the first bond shelf 18 to separate the plated material into the first and second conductive strips 44 and 46. All exposed copper surfaces may then be plated with gold."

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Complete set of Marked-up Claims as Amended

13. (Amended) A method for assembling an electronic package, comprising:

forming a housing which has a bond pad located on a first surface of a bond shelf, the bond shelf having a second surface along the thickness of the bond shelf ~~which has a edge~~;

forming a conductive strip along the second surface ~~edge~~ of the bond shelf;

and

removing a portion of the conductive strip.

14. (Amended) The method as recited in claim 13, wherein

the conductive strip is formed by plating a conductive material onto the ~~edge~~second surface.

17. (Amended) The method as recited in claim 13, wherein

the portion of the conductive strip is removed by

etching away a portion of a conductive material on the second surface of the bond shelf.

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18. (Amended) The method as recited in claim 13, wherein the conductive strip is formed along the ~~edge~~ second surface of the bond shelf by masking all surfaces of the bond shelf except for the ~~edge~~ second surface of the bond shelf, and plating a conductive material onto the ~~edge~~ second surface of the bond shelf.

21. (Amended) A method of forming an integrated circuit package, comprising:

providing a package housing having a first plurality of bonding pads located on a first surface of a first bond shelf, the first bond shelf having a second surface along the thickness of the bond shelf~~first edge~~;

forming a first conductive strip along the ~~first edge~~second surface of the first bond shelf, the first conductive strip wrapping around ~~the~~ a first edge of the first bond shelf ~~from~~ to at least one of the first plurality of bonding pads on the first surface of the first bond shelf, the at least one of the first plurality of bonding pads coupled to a first conductor under the first bond shelf; and,

removing a portion of the first conductive strip.

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22. (Amended) The method as recited in claim 21, wherein the first conductive strip is formed by plating a conductive material onto the ~~first edge~~second surface.

27. (Amended) The method as recited in claim 21, wherein the portion of the first conductive strip is removed by etching away a portion of the first conductive strip on the second surface of the first bond shelf.

30. (Amended) The method as recited in claim 28, wherein the etching of the second conductive layer to further form a second conductor, and the package housing has a second plurality of bonding pads located on a first surface of the second bond shelf, the second bond shelf having a ~~second edge~~second surface along the thickness of the second bond shelf, the package housing is further provided by placing a third dielectric substrate on the second conductive layer of the second dielectric substrate, the third dielectric substrate having a third

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conductive layer, and

etching the third conductive layer to form a second plurality of bonding pads, and

the method further includes

forming a second conductive strip along the second surface ~~edge~~ of the second bond shelf, the second conductive strip wrapping around ~~the~~ a ~~second~~ first edge of the second bond shelf ~~from~~ to at least one of the second plurality of bonding pads on the first surface of the second bond shelf, the at least one of the first plurality of bonding pads on the first surface of the second bond shelf coupled to the second conductor under the second bond shelf.

32. (Amended) The method as recited in claim 30, wherein

the second conductive strip is formed by plating a conductive material onto the second ~~edge~~surface of the second bond shelf.

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Conclusion

In view of the amendments and remarks made above, it is respectfully submitted that the pending claims are in condition for allowance, and such action is respectfully solicited.

Respectfully submitted,

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Dated: September 27, 2002

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